

Course Outline for: MATH 1500 Pre-Calculus**A. Course Description:**

1. Number of credits: 5
2. Lecture hours per week: 5
3. Prerequisites: MATH 1100 (C or better); OR
High School GPA: 2.8-3.9 and High School Pre-Calculus or a
higher-level math course with a grade of C- or better; OR
ACT Math Sub-Score: 25-26; OR
ACCUPLACER Next Gen: Quantitative Reasoning, Algebra
and Statistics 285-300, Advanced Algebra Functions 275-289
4. Corequisites: None
5. MnTC Goals: Goal 4 Mathematical/Logical Reasoning

This course is intended to prepare students for a multiple-term calculus sequence. It covers a thorough exploration of trigonometric functions, along with polar coordinates and equations, complex numbers, DeMoivre's Theorem, vectors and their applications, the conic sections, and parametric equations. Students may not receive credit for both MATH 1500 and MATH 1150.

B. Date last reviewed/updated: April 2024**C. Outline of Major Content Areas:**

1. Review of Basic Functions from College Algebra (Polynomial, Rational, Exponential, and Logarithmic Functions).
2. Right Triangle and Circular Trigonometry with Applications.
3. Inverse Trigonometric Functions, Trigonometric Equations and Trigonometric Identities.
4. Polar Coordinates and Parametric Curves, Complex Plane and DeMoivre's Theorem, Conic Sections.
5. Vectors with Basic Physical Applications.

D. Course Learning Outcomes:

Upon successful completion of the course, the student will be able to:

1. Demonstrate mastery of basic functions from College Algebra. (Goal 4b, c, d)
2. Apply the unit circle definitions of the trigonometric functions. (Goal 4b, c)
3. Graph trigonometric functions as visual summaries of their properties. (Goal 2a, 4a, b)
4. Solve triangles with sufficient information given, including applications. (Goal 2b; 4b, c, d)
5. Simplify trigonometric expressions and prove new identities using established trigonometric identities to. (Goal 4a, b, c, d)
6. Define inverse trigonometric functions and use them to solve problems. (Goal 4b, d)

7. Analyze equations and graphs of conic sections, and use them in applications. (Goal 4a, c)
8. Solve systems of nonlinear equations using algebraic and graphical methods. (Goal 4a, b)
9. Express complex numbers in polar form, and use DeMoivre's theorem to find powers and roots of complex numbers. (Goal 2b; 4b, d)
10. Solve applied problems using vectors. (Goal 2a, c; 4a d)
11. Describe curves in a plane using polar equations and parametric equations. (Goal 4a, c, d)

E. Methods for Assessing Student Learning:

Methods for assessment may include, but are not limited to, the following:

1. In-class testing
2. Take-home testing
3. Assignments
4. Quizzes
5. Attendance
6. Group or individual projects
7. Research

F. Special Information:

A scientific or graphing calculator may be required.